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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/747,731
Filing Date: December 22, 2000
Appellant(s): YAMAZAKI ET AL.

Mark J. Murphy
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed March 5, 2008, appealing from the Office action mailed August 10, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 2,435,997 A	BENNETT	2-1948
US 3,110,620 A	BERTELSEN et al.	11-1963
US 3,931,490 A	GROTHE et al.	1-1976

US 4,187,801 A	MONK	2-1980
US 4,469,719 A	MARTIN	9-1984
US 4,596,735 A	NOGUCHI et al.	6-1986
US 4,627,989 A	FEUERSTEIN et al.	12-1986
US 5,258,325 A	SPITZER et al.	11-1993
US 5,701,055 A	NAGAYAMA et al.	12-1997
US 5,817,366 A	ARAI et al.	10-1998
JP 11-61386 A	YAMAMOTO et al.	3-1999
US 6,179,923 B1	YAMAMOTO et al.	1-2001
US 6,326,726 B1	MIZUTANI et al.	12-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 20–22, 44, 45, 48, 63, 70, 74, and 156, are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A) in view of Grothe et al. (US 3,931,490 A), Monk (US 4,187,801 A), and Nagayama et al. (US 5,701,055 A).

With respect to claims 20 and 48, Arai teaches a method of manufacturing a display device in a cluster tool [abstract; c. 2, ll. 31 – 35; and c. 3, ll. 10 – 15]. Each processing chamber, of which there are at least two, has an evaporation source for the deposition of a material, which may be an organic electroluminescence material, on the substrate [c. 3, l. 66 – c. 5, l. 55]. As the substrate is transferred between chambers,

layers of different EL materials are successively applied to produce the display device [c. 4, ll. 34 – 51 and c. 9, ll. 1 – 20]. Arai does not place any limitations on the layer deposition processes carried-out in the chambers.

Arai does not teach that: (i) fixing a mask to the substrate wherein the mask is located between the substrate and the first evaporation source; (ii) the first and second evaporation sources have a first direction longer than a second direction or that the relative positions of the sources; or (iii) the substrates are repeatedly moved during deposition so that a same portion of the substrate is coated with the organic EL material at least twice.

With respect to (i), Nagayama teaches a process for forming an electroluminescent device by vapor deposition of the various layers that includes fixing a shadow mask between the substrate and a deposition source in order to form the desired patterned structures on the substrate [8:42-62]. It would have been obvious to one of ordinary skill in the art to modify the process of Arai so as to utilize a shadow mask in the claimed fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully forming the desired patterns of organic electroluminescent material on the substrate.

With respect to (ii), Grothe teaches that, when coating a substrate by vapor deposition, an evaporation source elongated in one dimension results in enhanced vapor density and deposition uniformity over the entire width of the substrate [c. 5, ll. 40 – 50 and 60 – 63]. It is the examiner's position that the source of Grothe reads on Appellant's source. It would have been obvious to one of ordinary skill in the art to

modify the process of Arai so as to utilize, as the evaporation source, the evaporation source of Grothe. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of achieving enhanced vapor density and deposition uniformity, as taught by Grothe.

With respect to (iii), Monk teaches that, in a process where a substrate is coated from an evaporation source, it is known to move the substrate and the evaporation source relative to each other [c. 1, ll. 9 – 21]. Doing so yields a uniform coating [c. 1, l. 15]. It would have been obvious to one of ordinary skill in the art to further modify the process of Arai so as to move the substrate and the evaporation sources relative to each other, as taught by Monk. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of yielding a uniform coating.

Lastly, it is well-known in the art of coating substrates to repeat a coating step the number of times required to build-up a coating of a desired thickness. Consequently, it would have been obvious to one of ordinary skill in the art to do so.

With respect to claim 21, none of the cited references teach cleaning the inside of the deposition chambers. It is the examiner's position, however, that cleaning the inside of a deposition chamber is a well-known means of eliminating contaminants in the chamber. Consequently, it would have been obvious to one of ordinary skill in the art to do so.

With respect to claim 22, the transfer vacuum chamber 1 of Arai reads on a "conveyor chamber."

With respect to claims 44 and 45, it would have been obvious, to one of ordinary skill in the art, to optimize the orientation of the source with respect to the direction of motion so as to achieve the greatest efficiency and uniformity of coating. In particular, an orientation in which the direction of elongation of the source is perpendicular to the direction of motion allows coating the widest swath of substrate possible with each pass of the coating source.

With respect to claim 63, it is the examiner's position that the shape and distribution of the film thickness is a physical characteristic inherently arising from shape and arrangement of the evaporation source. Since this combination of references otherwise teaches all of Appellant's other method limitations — including the shape and arrangement of the evaporation source(s) — it is the examiner's position that the deposited film inherently possesses the characteristics recited in this claim.

With respect to claim 70, it is the examiner's position that the cluster tool arrangement, with its multiple coating chambers separated via a transfer chamber, reads on Appellant's claimed "chambers connected with each other through at least one gate."

With respect to claim 74, none of the cited references explicitly states that the evaporation sources has a length exceeding 300 mm along the first direction. It is the examiner's position that, especially in view of the teaching of Grothe, it would have been obvious to one of ordinary skill in the art to select the elongated dimension of the source commensurate with the width of area to be covered. In other words, the length of the elongated dimension of the source is a result-effective variable effecting the degree of

coverage and length of time of the overall coating process. The greater the area covered, the shorter the coating process. Consequently, it would have been obvious to one of ordinary skill in the art to optimize the length of the elongated dimension of the coating source by routine experimentation, absent evidence of criticality. See MPEP 2144.05.

With respect to claim 156, Arai places no limitation on the sort of EL device manufactured. Consequently, it is the Examiner's position that the disclosed process may advantageously manufacture any desired EL device, including a passive matrix display.

Claims 37, 43, 48, 53, 64, 75, and 157, are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Bennett (US 2,435,997 A), Grothe et al. (US 3,931,490 A), and Nagayama et al. (US 5,701,055 A).

The teaching of Arai is detailed above. Arai does not place any limitations on the vapor deposition processes carried-out in the chambers.

Arai does not teach: (i) fixing a mask to the substrate wherein the mask is located between the substrate and the first evaporation source; (ii) that the first and second evaporation sources have a first direction longer than a second direction; or (iii) that the relative positions of the sources and the substrates are repeatedly moved during deposition so that a same portion of the substrate is coated with the organic EL material at least twice.

With respect to (i), Nagayama teaches a process for forming an electroluminescent device by vapor deposition of the various layers that includes fixing a shadow mask between the substrate and a deposition source in order to form the desired patterned structures on the substrate [8:42-62]. It would have been obvious to one of ordinary skill in the art to modify the process of Arai so as to utilize a shadow mask in the claimed fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully forming the desired patters of organic electroluminescent material on the substrate.

With respect to (ii), Grothe teaches that, when coating a substrate by vapor deposition, an evaporation source elongated in one dimension results in enhanced vapor density and deposition uniformity over the entire width of the substrate [c. 5, ll. 40 – 50 and 60 – 63]. It is the examiner's position that the source of Grothe reads on Appellant's source. It would have been obvious to one of ordinary skill in the art to modify the process of Arai so as to utilize, as the evaporation source, the evaporation source of Grothe. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of achieving enhanced vapor density and deposition uniformity, as taught by Grothe.

With respect to (iii), Bennett teaches that, in a vacuum vapor deposition process, moving the evaporation source with respect to the substrate improves deposition speed and uniformity [c. 3, ll. 1 – 10]. It would have been further obvious to one of ordinary skill in the art to modify the method of Arai so as to move the evaporation source relative to the substrate, as taught by Bennett. One of ordinary skill in the art would

have been motivated to do so by the desire and expectation of improving deposition speed and uniformity.

None of the cited references teach coating the same portion of the substrate twice. It is, nevertheless, well-known in the art of coating substrates to repeat a coating step the number of times required to build-up a coating of a desired thickness. Consequently, it would have been obvious to one of ordinary skill in the art to do so. It would have been further obvious, to one of ordinary skill in the art, to optimize the orientation of the source with respect to the direction of motion so as to achieve the greatest efficiency and uniformity of coating. In particular, an orientation in which the direction of elongation of the source is perpendicular to the direction of motion allows coating the widest swath of substrate possible with each pass of the coating source.

With respect to claim 53, none of the cited references teach coating the same portion of the substrate twice. It is, nevertheless, well-known in the art of coating substrates to repeat a coating step the number of times required to build-up a coating of a desired thickness. Consequently, it would have been obvious to one of ordinary skill in the art to do so.

With respect to claim 64, it is the examiner's position that the shape and distribution of the film thickness is a physical characteristic inherently arising from shape and arrangement of the evaporation source. Since this combination of references otherwise teaches all of Appellant's other method limitations — including the shape and arrangement of the evaporation source(s) — it is the examiner's position that the deposited film inherently possesses the characteristics recited in this claim.

With respect to claim 75, none of the cited references explicitly states that the evaporation sources has a length exceeding 300 mm along the first direction. It is the examiner's position that, especially in view of the teaching of Grothe, it would have been obvious to one of ordinary skill in the art to select the elongated dimension of the source commensurate with the width of area to be covered. In other words, the length of the elongated dimension of the source is a result-effective variable effecting the degree of coverage and length of time of the overall coating process. The greater the area covered, the shorter the coating process. Consequently, it would have been obvious to one of ordinary skill in the art to optimize the length of the elongated dimension of the coating source by routine experimentation, absent evidence of criticality. See MPEP 2144.05.

With respect to claim 157, Arai places no limitation on the sort of EL device manufactured. Consequently, it is the Examiner's position that the disclosed process may advantageously manufacture any desired EL device, including a passive matrix display.

Claims 38, 48, 56, 65, 76, 153, and 158, are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Bennett (US 2,435,997 A), Grothe et al. (US 3,931,490 A), Nagayama et al. (US 5,701,055 A), and Monk (US 4,187,801 A).

The combined teaching of Arai, Bennett, Grothe, and Nagayama is detailed above. None of the references teach that the evaporation sources are longer than at least one edge of the substrate. Monk teaches that, in a vapor deposition method, it is conventional to treat a larger area than covered by the substrate to avoid edge effects [c. 1, ll. 17 – 20]. Consequently, it would have been obvious to one of ordinary skill in the art to modify the method of Arai, Bennett, and Grothe, so as to utilize an elongated source that is longer than at least one edge of the substrate. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of avoiding edge effects, as suggested by Monk.

None of the cited references teach coating the same portion of the substrate twice. It is, nevertheless, well-known in the art of coating substrates to repeat a coating step the number of times required to build-up a coating of a desired thickness. Consequently, it would have been obvious to one of ordinary skill in the art to do so. It would have been further obvious, to one of ordinary skill in the art, to optimize the orientation of the source with respect to the direction of motion so as to achieve the greatest efficiency and uniformity of coating. In particular, an orientation in which the direction of elongation of the source is perpendicular to the direction of motion allows coating the widest swath of substrate possible with each pass of the coating source.

With respect to claim 53, none of the cited references teach coating the same portion of the substrate twice. It is, nevertheless, well-known in the art of coating substrates to repeat a coating step the number of times required to build-up a coating of

a desired thickness. Consequently, it would have been obvious to one of ordinary skill in the art to do so.

With respect to claim 65, it is the examiner's position that the shape and distribution of the film thickness is a physical characteristic inherently arising from shape and arrangement of the evaporation source. Since this combination of references otherwise teaches all of Appellant's other method limitations — including the shape and arrangement of the evaporation source(s) — it is the examiner's position that the deposited film inherently possesses the characteristics recited in this claim.

With respect to claim 76, none of the cited references explicitly states that the evaporation sources has a length exceeding 300 mm along the first direction. It is the examiner's position that, especially in view of the teaching of Grothe, it would have been obvious to one of ordinary skill in the art to select the elongated dimension of the source commensurate with the width of area to be covered. In other words, the length of the elongated dimension of the source is a result-effective variable effecting the degree of coverage and length of time of the overall coating process. The greater the area covered, the shorter the coating process. Consequently, it would have been obvious to one of ordinary skill in the art to optimize the length of the elongated dimension of the coating source by routine experimentation, absent evidence of criticality. See MPEP 2144.05.

With respect to claim 153, as noted above, the claimed relative movement would have been obvious based on the teaching of Bennett.

With respect to claim 158, Arai places no limitation on the sort of EL device manufactured. Consequently, it is the Examiner's position that the disclosed process may advantageously manufacture any desired EL device, including a passive matrix display.

Claim 39, 48, 53, 57, 66, 77, and 159, are rejected under 35 U.S.C. § 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Feuerstein et al. (US 4,627,989 A), Bennett (US 2,435,997 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent).

The teaching of Arai is detailed above. Arai does not place any limitations on the vapor deposition processes carried-out in the chambers.

Arai does not teach fixing a mask to the substrate wherein the mask is located between the substrate and the first evaporation source. Nagayama teaches a process for forming an electroluminescent device by vapor deposition of the various layers that includes fixing a shadow mask between the substrate and a deposition source in order to form the desired patterned structures on the substrate (8:42-62). It would have been obvious to one of ordinary skill in the art to modify the process of Arai so as to utilize a shadow mask in the claimed fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully forming the desired patterns of organic electroluminescent material on the substrate.

Arai does not teach that first and second evaporation sources comprise a plurality of evaporation cells arranged along a first direction or that the relative positions of the sources are repeatedly moved with respect to the substrate during deposition so that a same portion of the substrate is coated at least twice. Feuerstein teaches a method of coating a substrate utilizing a vacuum evaporator comprising an elongated array of individually controllable vapor sources [c. 1, ll. 21 - 24; c. 2, ll. 40 - 45; c. 4, ll. 55 - 57; and c. 6, ll. 18 - 26]. Such a source facilitates greater control over deposition thickness and uniformity [c. 2, ll. 41 - 45]. It would have been obvious to one of ordinary skill in the art to modify the process of Arai so as to utilize an evaporation source comprising a plurality of evaporation cells arranged along a first direction so as to achieve greater control over deposition thickness and uniformity, as suggested by Feuerstein.

It would have been further obvious to move the relative position of this source with respect to the substrate during evaporation. Bennett teaches that moving the source with respect to the substrate improves deposition speed and uniformity [see above]. Specifically moving the source instead of the substrate is considered advantageous because it requires a smaller vacuum chamber [c. 3, l. 72 - c. 4, l. 3].

None of the cited references teach coating the same portion of substrate twice. It is, nevertheless, well-known in the art of coating substrates to repeat a coating step the number of times required to build-up a coating of a desired thickness. Consequently, it would have been obvious to do so.

It would have been obvious to one of ordinary skill in the art to optimize the orientation of the source with respect to the direction of motion so as to achieve the greatest efficiency and uniformity of coating. In particular, an orientation in which the direction of elongation of the source is perpendicular to the direction of motion allows coating the widest swath of substrate possible with each pass of the coating source.

Lastly, none of the cited references teach Appellant's limitation requiring "cleaning an inside of the evaporation chamber." Yamamoto teaches that, in the vapor deposition of organic thin films for EL devices, it is conventional to clean the parts equipped in each chamber and the inside wall of the chambers after every deposition on the substrate (2:23-27). Doing so prevents contamination of the substrate by residual organic material having a tendency to peel-off of the chamber surfaces (2:63-3:8). Consequently, it would have been obvious to one of ordinary skill in the art to modify the method of Arai, Feuerstein, and Bennett so as to perform the conventional step of cleaning the deposition chamber. One of ordinary skill would have been motivated to do so by the desire and expectation of preventing contamination of the substrate.

The examiner notes that the body of Yamamoto's disclosure is directed to a method in which an additional set of cleaned parts is provided in each chamber, thereby eliminating the need to clean after each step, thereby saving time (5:45-8:30). Consequently, in the alternative, it would have been obvious to one of ordinary skill in the art to modify the method of Arai, Feuerstein, and Bennett so as to provide an additional set of cleaned parts to eliminate the need for repeated cleaning. One of ordinary skill in the art would have been motivated to do so by the desire and

expectation of reducing the processing time. The parts still need to be cleaned at some point, either before, during, or after the deposition process. Consequently, Yamamoto's invention also reads on Appellant's claimed "cleaning an inside of the evaporation chamber."

With respect to claim 53, none of the cited references teach coating the same portion of substrate twice. It is, nevertheless, well-known in the art of coating substrates to repeat a coating step the number of times required to build-up a coating of a desired thickness. Consequently, it would have been obvious to do so.

With respect to claim 66, it is the examiner's position that the shape and distribution of the film thickness is a physical characteristic inherently arising from shape and arrangement of the evaporation source. Since this combination of references otherwise teaches all of Appellant's other method limitations — including the shape and arrangement of the evaporation source(s) — it is the examiner's position that the deposited film inherently possesses the characteristics recited in this claim.

With respect to claim 77, none of the cited references explicitly states that the evaporation sources has a length exceeding 300 mm along the first direction. It is the examiner's position that, especially in view of the teaching of Grothe, it would have been obvious to one of ordinary skill in the art to select the elongated dimension of the source commensurate with the width of area to be covered. In other words, the length of the elongated dimension of the source is a result-effective variable effecting the degree of coverage and length of time of the overall coating process. The greater the area covered, the shorter the coating process. Consequently, it would have been obvious to

one of ordinary skill in the art to optimize the length of the elongated dimension of the coating source by routine experimentation, absent evidence of criticality. See MPEP 2144.05.

With respect to claim 159, Arai places no limitation on the sort of EL device manufactured. Consequently, it is the Examiner's position that the disclosed process may advantageously manufacture any desired EL device, including a passive matrix display.

Claim 40, 48, 58, 67, 78, 154, and 160, are rejected under 35 U.S.C. § 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Feuerstein et al. (US 4,627,989 A), Bennett (US 2,435,997 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent) or, in the alternative, over Arai et al., in view of Nagayama et al. (US 5,701,055 A), Feuerstein et al., Bennett, Monk (US 4,187,801 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent).

The combined teaching of Arai, Nagayama, Feuerstein, and Bennett is detailed above. Additionally, Feuerstein illustrates, but does not require, a source that is longer than at least one edge of the substrate [Fig. 1]. Nevertheless, it would have been obvious to utilize a source longer than at least one edge of the substrate to avoid edge effects, as taught by Monk [see above].

It would have been further obvious to move the relative position of this source with respect to the substrate during evaporation. Bennett teaches that moving the source with respect to the substrate improves deposition speed and uniformity [see above]. Specifically moving the source instead of the substrate is considered advantageous because it requires a smaller vacuum chamber [c. 3, l. 72 - c. 4, l. 3].

None of the cited references teach coating the same portion of substrate twice. It is, nevertheless, well-known in the art of coating substrates to repeat a coating step the number of times required to build-up a coating of a desired thickness. Consequently, it would have been obvious to do so.

It would have been obvious to one of ordinary skill in the art to optimize the orientation of the source with respect to the direction of motion so as to achieve the greatest efficiency and uniformity of coating. In particular, an orientation in which the direction of elongation of the source is perpendicular to the direction of motion allows coating the widest swath of substrate possible with each pass of the coating source.

Lastly, none of the cited references teach Appellant's newly-added limitation requiring "cleaning an inside of the evaporation chamber." Yamamoto teaches that, in the vapor deposition of organic thin films for EL devices, it is conventional to clean the parts equipped in each chamber and the inside wall of the chambers after every deposition on the substrate (2:23-27). Doing so prevents contamination of the substrate by residual organic material having a tendency to peel-off of the chamber surfaces (2:63-3:8). Consequently, it would have been obvious to one of ordinary skill in the art to modify the method of Arai, Feuerstein, and Bennett so as to perform the conventional

step of cleaning the deposition chamber. One of ordinary skill would have been motivated to do so by the desire and expectation of preventing contamination of the substrate.

The examiner notes that the body of Yamamoto's disclosure is directed to a method in which an additional set of cleaned parts is provided in each chamber, thereby eliminating the need to clean after each step, thereby saving time (5:45-8:30). Consequently, in the alternative, it would have been obvious to one of ordinary skill in the art to modify the method of Arai, Feuerstein, and Bennett so as to provide an additional set of cleaned parts to eliminate the need for repeated cleaning. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of reducing the processing time. The parts still need to be cleaned at some point, either before, during, or after the deposition process. Consequently, Yamamoto's invention also reads on Appellant's claimed "cleaning an inside of the evaporation chamber."

With respect to claim 67, it is the examiner's position that the shape and distribution of the film thickness is a physical characteristic inherently arising from shape and arrangement of the evaporation source. Since this combination of references otherwise teaches all of Appellant's other method limitations — including the shape and arrangement of the evaporation source(s) — it is the examiner's position that the deposited film inherently possesses the characteristics recited in this claim.

With respect to claim 78, none of the cited references explicitly states that the evaporation sources has a length exceeding 300 mm along the first direction. It is the

examiner's position that, especially in view of the teaching of Grothe, it would have been obvious to one of ordinary skill in the art to select the elongated dimension of the source commensurate with the width of area to be covered. In other words, the length of the elongated dimension of the source is a result-effective variable effecting the degree of coverage and length of time of the overall coating process. The greater the area covered, the shorter the coating process. Consequently, it would have been obvious to one of ordinary skill in the art to optimize the length of the elongated dimension of the coating source by routine experimentation, absent evidence of criticality. See MPEP 2144.05.

With respect to claim 154, as noted above, the claimed relative movement would have been obvious based on the teaching of Bennett.

With respect to claim 160, Arai places no limitation on the sort of EL device manufactured. Consequently, it is the Examiner's position that the disclosed process may advantageously manufacture any desired EL device, including a passive matrix display.

Claim 49 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Arai et al. (US 5,817,366 A) in view of Grothe et al. (US 3,931,490 A), Monk (US 4,187,801 A), and Nagayama et al. (US 5,701,055 A) as applied to claim 20 above, further in view of Spitzer et al. (US 5,258,325 A).

The teachings of all of the cited references are described above. None of these teach that the display device is an active matrix electroluminescence display device.

Spitzer et al. teach that it is the electrode arrangement that distinguishes an active matrix device. Consequently, it is the examiner's position that it would have been obvious to utilize the above-cited methods of depositing organic electroluminescent material to manufacture an active matrix electroluminescent display device. One of ordinary skill in the art would have been motivated by the expectation of successfully manufacturing an active matrix EL display device since the deposition of the organic EL material does not determine whether or not the matrix is active.

Claims 54, 68, 71, 79, and 161, are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Bennett (US 2,435,997 A), Grothe et al. (US 3,931,490 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent).

The teaching of Arai is detailed above. Arai does not place any limitations on the vapor deposition processes carried-out in the chambers.

Arai does not teach fixing a mask to the substrate wherein the mask is located between the substrate and the first evaporation source. Nagayama teaches a process for forming an electroluminescent device by vapor deposition of the various layers that includes fixing a shadow mask between the substrate and a deposition source in order

to form the desired patterned structures on the substrate (8:42-62). It would have been obvious to one of ordinary skill in the art to modify the process of Arai so as to utilize a shadow mask in the claimed fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully forming the desired patterns of organic electroluminescent material on the substrate.

Arai does not teach that the first and second evaporation sources have a first direction longer than a second direction or that the relative positions of the sources and the substrates are repeatedly moved during deposition so that a same portion of the substrate is coated with the organic EL material at least twice. Grothe teaches that, when coating a substrate by vapor deposition, an evaporation source elongated in one dimension results in enhanced vapor density and deposition uniformity over the entire width of the substrate [c. 5, ll. 40 – 50 and 60 – 63]. It is the examiner's position that the source of Grothe reads on Appellant's source. It would have been obvious to one of ordinary skill in the art to modify the process of Arai so as to utilize, as the evaporation source, the evaporation source of Grothe. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of achieving enhanced vapor density and deposition uniformity, as taught by Grothe.

Bennett teaches that, in a vacuum vapor deposition process, moving the evaporation source with respect to the substrate improves deposition speed and uniformity [c. 3, ll. 1 – 10]. It would have been further obvious to one of ordinary skill in the art to modify the method of Arai so as to move the evaporation source relative to the substrate, as taught by Bennett. One of ordinary skill in the art would have been

motivated to do so by the desire and expectation of improving deposition speed and uniformity.

None of the cited references teach coating the same portion of the substrate twice. It is, nevertheless, well-known in the art of coating substrates to repeat a coating step the number of times required to build-up a coating of a desired thickness. Consequently, it would have been obvious to one of ordinary skill in the art to do so.

It would have been further obvious, to one of ordinary skill in the art, to optimize the orientation of the source with respect to the direction of motion so as to achieve the greatest efficiency and uniformity of coating. In particular, an orientation in which the direction of elongation of the source is perpendicular to the direction of motion allows coating the widest swath of substrate possible with each pass of the coating source.

Lastly, none of the cited references teach Appellant's newly-added limitation requiring "cleaning an inside of the evaporation chamber." Yamamoto teaches that, in the vapor deposition of organic thin films for EL devices, it is conventional to clean the parts equipped in each chamber and the inside wall of the chambers after every deposition on the substrate (2:23-27). Doing so prevents contamination of the substrate by residual organic material having a tendency to peel-off of the chamber surfaces (2:63-3:8). Consequently, it would have been obvious to one of ordinary skill in the art to modify the method of Arai, Feuerstein, and Bennett so as to perform the conventional step of cleaning the deposition chamber. One of ordinary skill would have been motivated to do so by the desire and expectation of preventing contamination of the substrate.

The examiner notes that the body of Yamamoto's disclosure is directed to a method in which an additional set of cleaned parts is provided in each chamber, thereby eliminating the need to clean after each step, thereby saving time (5:45-8:30). Consequently, in the alternative, it would have been obvious to one of ordinary skill in the art to modify the method of Arai, Feuerstein, and Bennett so as to provide an additional set of cleaned parts to eliminate the need for repeated cleaning. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of reducing the processing time. The parts still need to be cleaned at some point, either before, during, or after the deposition process. Consequently, Yamamoto's invention also reads on Appellant's claimed "cleaning an inside of the evaporation chamber."

With respect to claim 68, it is the examiner's position that the shape and distribution of the film thickness is a physical characteristic inherently arising from shape and arrangement of the evaporation source. Since this combination of references otherwise teaches all of Appellant's other method limitations — including the shape and arrangement of the evaporation source(s) — it is the examiner's position that the deposited film inherently possesses the characteristics recited in this claim.

With respect to claim 79, none of the cited references explicitly states that the evaporation sources has a length exceeding 300 mm along the first direction. It is the examiner's position that, especially in view of the teaching of Grothe, it would have been obvious to one of ordinary skill in the art to select the elongated dimension of the source commensurate with the width of area to be covered. In other words, the length of the

elongated dimension of the source is a result-effective variable effecting the degree of coverage and length of time of the overall coating process. The greater the area covered, the shorter the coating process. Consequently, it would have been obvious to one of ordinary skill in the art to optimize the length of the elongated dimension of the coating source by routine experimentation, absent evidence of criticality. See MPEP 2144.05.

With respect to claim 161, Arai places no limitation on the sort of EL device manufactured. Consequently, it is the Examiner's position that the disclosed process may advantageously manufacture any desired EL device, including a passive matrix display.

Claims 55, 69, 72, 80, 155, and 162, are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Bennett (US 2,435,997 A), Grothe et al. (US 3,931,490 A), Monk (US 4,187,801 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent).

The combined teaching of Arai, Nagayama, Bennett, and Grothe is detailed above. None of the references teach that the evaporation sources are longer than at least one edge of the substrate. Monk teaches that, in a vapor deposition method, it is conventional to treat a larger area than covered by the substrate to avoid edge effects [c. 1, ll. 17 – 20]. Consequently, it would have been obvious to one of ordinary skill in

the art to modify the method of Arai, Nagayama, Bennett, and Grothe, so as to utilize an elongated source that is longer than at least one edge of the substrate. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of avoiding edge effects, as suggested by Monk.

None of the cited references teach coating the same portion of the substrate twice. It is, nevertheless, well-known in the art of coating substrates to repeat a coating step the number of times required to build-up a coating of a desired thickness. Consequently, it would have been obvious to one of ordinary skill in the art to do so.

It would have been further obvious, to one of ordinary skill in the art, to optimize the orientation of the source with respect to the direction of motion so as to achieve the greatest efficiency and uniformity of coating. In particular, an orientation in which the direction of elongation of the source is perpendicular to the direction of motion allows coating the widest swath of substrate possible with each pass of the coating source.

Lastly, none of the cited references teach Appellant's limitation requiring "cleaning an inside of the evaporation chamber." Yamamoto teaches that, in the vapor deposition of organic thin films for EL devices, it is conventional to clean the parts equipped in each chamber and the inside wall of the chambers after every deposition on the substrate (2:23-27). Doing so prevents contamination of the substrate by residual organic material having a tendency to peel-off of the chamber surfaces (2:63-3:8). Consequently, it would have been obvious to one of ordinary skill in the art to modify the method of Arai, Feuerstein, and Bennett so as to perform the conventional step of

cleaning the deposition chamber. One of ordinary skill would have been motivated to do so by the desire and expectation of preventing contamination of the substrate.

The examiner notes that the body of Yamamoto's disclosure is directed to a method in which an additional set of cleaned parts is provided in each chamber, thereby eliminating the need to clean after each step, thereby saving time (5:45-8:30). Consequently, in the alternative, it would have been obvious to one of ordinary skill in the art to modify the method of Arai, Feuerstein, and Bennett so as to provide an additional set of cleaned parts to eliminate the need for repeated cleaning. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of reducing the processing time. The parts still need to be cleaned at some point, either before, during, or after the deposition process. Consequently, Yamamoto's invention also reads on Appellant's claimed "cleaning an inside of the evaporation chamber."

With respect to claim 69, it is the examiner's position that the shape and distribution of the film thickness is a physical characteristic inherently arising from shape and arrangement of the evaporation source. Since this combination of references otherwise teaches all of Appellant's other method limitations — including the shape and arrangement of the evaporation source(s) — it is the examiner's position that the deposited film inherently possesses the characteristics recited in this claim.

With respect to claim 80, none of the cited references explicitly states that the evaporation sources has a length exceeding 300 mm along the first direction. It is the examiner's position that, especially in view of the teaching of Grothe, it would have been

obvious to one of ordinary skill in the art to select the elongated dimension of the source commensurate with the width of area to be covered. In other words, the length of the elongated dimension of the source is a result-effective variable effecting the degree of coverage and length of time of the overall coating process. The greater the area covered, the shorter the coating process. Consequently, it would have been obvious to one of ordinary skill in the art to optimize the length of the elongated dimension of the coating source by routine experimentation, absent evidence of criticality. See MPEP 2144.05.

With respect to claim 155, as noted above, the claimed relative movement would have been obvious based on the teaching of Bennett.

With respect to claim 162, Arai places no limitation on the sort of EL device manufactured. Consequently, it is the Examiner's position that the disclosed process may advantageously manufacture any desired EL device, including a passive matrix display.

Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Bennett (US 2,435,997 A) and Grothe et al. (US 3,931,490 A), as applied to claim 37 above, further in view of Spitzer et al. (US 5,258,325 A).

The teachings of all of the cited references are described above. None of these teach that the display device is an active matrix electroluminescence display device.

Spitzer et al. teach that it is the electrode arrangement that distinguishes an active matrix device. Consequently, it is the examiner's position that it would have been obvious to utilize the above-cited methods of depositing organic electroluminescent material to manufacture an active matrix electroluminescent display device. One of ordinary skill in the art would have been motivated by the expectation of successfully manufacturing an active matrix EL display device since the deposition of the organic EL material does not determine whether or not the matrix is active.

Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Bennett (US 2,435,997 A), Grothe et al. (US 3,931,490 A), and Monk (US 4,187,801 A), as applied to claim 38 above, further in view of Spitzer et al. (US 5,258,325 A).

The teachings of all of the cited references are described above. None of these teach that the display device is an active matrix electroluminescence display device.

Spitzer et al. teach that it is the electrode arrangement that distinguishes an active matrix device. Consequently, it is the examiner's position that it would have been obvious to utilize the above-cited methods of depositing organic electroluminescent material to manufacture an active matrix electroluminescent display device. One of ordinary skill in the art would have been motivated by the expectation of successfully manufacturing an active matrix EL display device since the deposition of the organic EL material does not determine whether or not the matrix is active.

Claim 61 rejected under 35 U.S.C. § 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5071,055 A), Feuerstein et al. (US 4,627,989 A), Bennett (US 2,435,997 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent), as applied to claim 39 above, further in view of Spitzer et al. (US 5,258,325 A).

The teachings of all of the cited references are described above. None of these teach that the display device is an active matrix electroluminescence display device.

Spitzer et al. teach that it is the electrode arrangement that distinguishes an active matrix device. Consequently, it is the examiner's position that it would have been obvious to utilize the above-cited methods of depositing organic electroluminescent material to manufacture an active matrix electroluminescent display device. One of ordinary skill in the art would have been motivated by the expectation of successfully manufacturing an active matrix EL display device since the deposition of the organic EL material does not determine whether or not the matrix is active.

Claim 62 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Feuerstein et al. (US 4,627,989 A), Bennett (US 2,435,997 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent) or, in the alternative, over Arai et al., in view of Nagayama et al., Feuerstein et al., Bennett, Monk (US 4,187,801 A),

and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent), as applied to claim 40 above, further in view of Spitzer et al. (US 5,258,325 A).

The teachings of all of the cited references are described above. None of these teach that the display device is an active matrix electroluminescence display device.

Spitzer et al. teach that it is the electrode arrangement that distinguishes an active matrix device. Consequently, it is the examiner's position that it would have been obvious to utilize the above-cited methods of depositing organic electroluminescent material to manufacture an active matrix electroluminescent display device. One of ordinary skill in the art would have been motivated by the expectation of successfully manufacturing an active matrix EL display device since the deposition of the organic EL material does not determine whether or not the matrix is active.

Claim 73 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A) in view of Grothe et al. (US 3,931,490 A), Monk (US 4,187,801 A), and Nagayama et al. (US 5,701,055 A), as applied to claim 20 above, further in view of Mizutani et al. (US 6,326,726 B1).

The combined teaching of Arai in view of Grothe, Monk, and Nagayama is detailed above.

None of the cited references teaches that the mask is fixed to the substrate by a magnet field.

Mizutani teaches a process of forming an electroluminescent device by vapor deposition of various organic layers through a shadow mask. The shadow mask is attached to the substrate utilizing an electromagnet (5:65-6:6). Doing so fits the mask securely against the substrate, facilitating the formation of a fine and accurate pattern (6:1-6).

It would have been obvious to one of ordinary skill in the art to modify the process of Arai in view of Grothe, Monk, and Nagayama so as to attach the mask to the substrate utilizing an electromagnet. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of facilitating the formation of a fine and accurate pattern.

Claims 81-88, 92-100, 141-144, 163, 164, and 166-176, are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A) in view of Grothe et al. (US 3,931,490 A), Monk (US 4,187,801 A), and Nagayama et al. (US 5,701,055 A).

The combined teaching of Arai in view of Grothe, Monk, and Nagayama is detailed above.

While Arai is silent with respect to precise nature of the organic EL layers deposited by the vapor process, Nagayama teaches forming a hole injecting layer and a light emitting layer over the hole injecting layer by a vapor deposition process (6:43-51 and 8:56-60). Nagayama further teaches that the structure includes a conducting film over the light emitting layer and a sealing layer over the light emitting layer.

Since Arai is non-limiting as to the precise nature of the organic EL layers deposited, it would have been obvious to one of ordinary skill in the art to modify the process so as to deposit the claimed structure since Nagayama teaches such a vapor-deposited structure is suitable for EL devices. Further, with respect to claim 85, it would have been obvious to one of ordinary skill in the art to seal the structure without exposure to the atmosphere (i.e., in the coating apparatus) so as to (i) prevent attack by moisture, and (ii) simplify the process by not removing the unsealed structure from the apparatus for additional treatment.

With respect to claims 84, 88, 94, 97, and 100, none of the cited references explicitly states that the evaporation sources has a length exceeding 300 mm along the first direction. It is the examiner's position that, especially in view of the teaching of Grothe, it would have been obvious to one of ordinary skill in the art to select the elongated dimension of the source commensurate with the width of area to be covered. In other words, the length of the elongated dimension of the source is a result-effective variable effecting the degree of coverage and length of time of the overall coating process. The greater the area covered, the shorter the coating process. Consequently, it would have been obvious to one of ordinary skill in the art to optimize the length of the elongated dimension of the coating source by routine experimentation, absent evidence of criticality. See MPEP 2144.05.

With respect to claims 141-144, the feature of these claims are taught by these references as noted above. See, in particular, the rejection of claim 96.

With respect to claims 163, 164, and 166-168, Arai places no limitation on the sort of EL device manufactured. Consequently, it is the Examiner's position that the disclosed process may advantageously manufacture any desired EL device, including a passive matrix display.

With respect to claims 169-176, the features of these claims are taught by or are obvious over the cited references as explained above. In particular, Nagayama teaches a rectangular mask opening.

Claims 89-91 and 165 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A) in view of Grothe et al. (US 3,931,490 A), Monk (US 4,187,801 A), and Nagayama et al. (US 5,701,055 A).

The combined teaching of Arai in view of Grothe, Monk, and Nagayama is detailed above. Arai does not teach moving the mask by one pixel portion increments between deposition of materials. Again, Nakayama teaches a process for the vapor deposition of organic EL layers through a shadow mask in which the mask is moved by one pixel portion increments between deposition of various EL organic layers (Fig. 8). Since Arai is non-limiting as to the precise nature of the organic EL layer vapor deposition , it would have been obvious to one of ordinary skill in the art to modify the process so as to deposit in the claimed fashion since Nagayama teaches such a vapor-deposited structure is suitable for EL devices.

With respect to claim 91, none of the cited references explicitly states that the evaporation sources has a length exceeding 300 mm along the first direction. It is the examiner's position that, especially in view of the teaching of Grothe, it would have been obvious to one of ordinary skill in the art to select the elongated dimension of the source commensurate with the width of area to be covered. In other words, the length of the elongated dimension of the source is a result-effective variable effecting the degree of coverage and length of time of the overall coating process. The greater the area covered, the shorter the coating process. Consequently, it would have been obvious to one of ordinary skill in the art to optimize the length of the elongated dimension of the coating source by routine experimentation, absent evidence of criticality. See MPEP 2144.05.

With respect to claim 165, Arai places no limitation on the sort of EL device manufactured. Consequently, it is the Examiner's position that the disclosed process may advantageously manufacture any desired EL device, including a passive matrix display.

Claim 101 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A) in view of Grothe et al. (US 3,931,490 A), Monk (US 4,187,801 A), and Nagayama et al. (US 5,701,055 A), as applied to claim 98 above, further in view of Spitzer et al. (US 5,258,325 A).

The teachings of all of the cited references are described above. None of these teach that the display device is an active matrix electroluminescence display device.

Spitzer et al. teach that it is the electrode arrangement that distinguishes an active matrix device. Consequently, it is the examiner's position that it would have been obvious to utilize the above-cited methods of depositing organic electroluminescent material to manufacture an active matrix electroluminescent display device. One of ordinary skill in the art would have been motivated by the expectation of successfully manufacturing an active matrix EL display device since the deposition of the organic EL material does not determine whether or not the matrix is active.

Claims 102-104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A) in view of Grothe et al. (US 3,931,490 A), Monk (US 4,187,801 A), and Nagayama et al. (US 5,701,055 A), as applied to claim 20 above, further in view of Bertelsen (US 3,110,620 A).

None of the cited references explicitly teach the features of these claims. Bertelsen teaches a process in which multiple layers (including transparent and conductive layers) are vapor deposited on a substrate, optionally via a mask, in which the substrate is situated above an evaporation coating source (Fig. 3 and 3:55-70). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of these references so as to arrange the substrate, mask, and coating source in

this fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully coating the substrate.

Claims 105-107 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Bennett (US 2,435,997 A), Grothe et al. (US 3,931,490 A), and Nagayama et al. (US 5,701,055 A), as applied to claim 37 above, further in view of Bertelsen (US 3,110,620 A).

None of the cited references explicitly teach the features of these claims. Bertelsen teaches a process in which multiple layers (including transparent and conductive layers) are vapor deposited on a substrate, optionally via a mask, in which the substrate is situated above an evaporation coating source (Fig. 3 and 3:55-70). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of these references so as to arrange the substrate, mask, and coating source in this fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully coating the substrate.

Claims 108-110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Bennett (US 2,435,997 A), Grothe et al. (US 3,931,490 A), Nagayama et al. (US 5,701,055 A), and Monk (US 4,187,801 A), as applied to claim 38 above, further in view of Bertelsen (US 3,110,620 A).

None of the cited references explicitly teach the features of these claims. Bertelsen teaches a process in which multiple layers (including transparent and conductive layers) are vapor deposited on a substrate, optionally via a mask, in which the substrate is situated above an evaporation coating source (Fig. 3 and 3:55-70). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of these references so as to arrange the substrate, mask, and coating source in this fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully coating the substrate.

Claims 111-113 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Feuerstein et al. (US 4,627,989 A), Bennett (US 2,435,997 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent), as applied to claim 39 above, further in view of Bertelsen (US 3,110,620 A).

None of the cited references explicitly teach the features of these claims. Bertelsen teaches a process in which multiple layers (including transparent and conductive layers) are vapor deposited on a substrate, optionally via a mask, in which the substrate is situated above an evaporation coating source (Fig. 3 and 3:55-70). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of these references so as to arrange the substrate, mask, and coating source in

this fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully coating the substrate.

Claims 114-116 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Feuerstein et al. (US 4,627,989 A), Bennett (US 2,435,997 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent) or, in the alternative, over Arai et al., in view of Nagayama et al. (US 5,701,055 A), Feuerstein et al., Bennett, Monk (US 4,187,801 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent), as applied to claim 340 above, further in view of Bertelsen (US 3,110,620 A).

None of the cited references explicitly teach the features of these claims. Bertelsen teaches a process in which multiple layers (including transparent and conductive layers) are vapor deposited on a substrate, optionally via a mask, in which the substrate is situated above an evaporation coating source (Fig. 3 and 3:55-70). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of these references so as to arrange the substrate, mask, and coating source in this fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully coating the substrate.

Claims 117-119 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Bennett (US 2,435,997 A), Grothe et al. (US 3,931,490 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent), as applied to claim 54 above, further in view of Bertelsen (US 3,110,620 A).

None of the cited references explicitly teach the features of these claims. Bertelsen teaches a process in which multiple layers (including transparent and conductive layers) are vapor deposited on a substrate, optionally via a mask, in which the substrate is situated above an evaporation coating source (Fig. 3 and 3:55-70). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of these references so as to arrange the substrate, mask, and coating source in this fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully coating the substrate.

Claims 120-122 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Bennett (US 2,435,997 A), Grothe et al. (US 3,931,490 A), Monk (US 4,187,801 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent), as applied to claim 55 above, further in view of Bertelsen (US 3,110,620 A).

None of the cited references explicitly teach the features of these claims. Bertelsen teaches a process in which multiple layers (including transparent and conductive layers) are vapor deposited on a substrate, optionally via a mask, in which the substrate is situated above an evaporation coating source (Fig. 3 and 3:55-70). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of these references so as to arrange the substrate, mask, and coating source in this fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully coating the substrate.

Claims 123-128 and 132-138 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A) in view of Grothe et al. (US 3,931,490 A), Monk (US 4,187,801 A), and Nagayama et al. (US 5,701,055 A), as applied to claims 81, 85, 92, 95, and 98, respectively, above, further in view of Bertelsen (US 3,110,620 A).

None of the cited references explicitly teach the features of these claims. Bertelsen teaches a process in which multiple layers (including transparent and conductive layers) are vapor deposited on a substrate, optionally via a mask, in which the substrate is situated above an evaporation coating source (Fig. 3 and 3:55-70). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of these references so as to arrange the substrate, mask, and coating source in

this fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully coating the substrate.

Claims 129-131 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 5,817,366 A) in view of Grothe et al. (US 3,931,490 A), Monk (US 4,187,801 A), and Nagayama et al. (US 5,701,055 A), as applied to claim 129-131 above, further in view of Bertelsen (US 3,110,620 A).

None of the cited references explicitly teach the features of these claims. Bertelsen teaches a process in which multiple layers (including transparent and conductive layers) are vapor deposited on a substrate, optionally via a mask, in which the substrate is situated above an evaporation coating source (Fig. 3 and 3:55-70). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of these references so as to arrange the substrate, mask, and coating source in this fashion. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully coating the substrate.

Claims 145-148 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Feuerstein et al. (US 4,627,989 A), Bennett (US 2,435,997 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent), as applied to claim 39 above, further in view of either Noguchi et al. (US 4,596,735 A) or Martin (US 4,469,719 A).

Arai, Nagayama, Feuerstein, Bennett, and Yamamoto are cited herein again as detailed above.

None of these references teaches the claimed source-mask distance.

Both Noguchi and Martin teach that the source-mask distance is a result-effective variable effecting various properties of the deposited film.

Consequently, it would have been obvious to one of ordinary skill in the art, absent evidence of criticality, to optimize this distance by routine experimentation. See MPEP 2144.05.

Claims 149-152 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Arai et al. (US 5,817,366 A), in view of Nagayama et al. (US 5,701,055 A), Feuerstein et al. (US 4,627,989 A), Bennett (US 2,435,997 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent) or, in the alternative, over Arai et al., in view of Nagayama et al. (US 5,701,055 A), Feuerstein et al., Bennett, Monk (US 4,187,801 A), and Yamamoto et al. (JP 11-61386 A, US 6,179,923 B1 provided as English-language equivalent), as applied to claim 40 above, further in view of either Noguchi et al. (US 4,596,735 A) or Martin (US 4,469,719 A).

Arai, Nagayama, Feuerstein, Bennett, Monk, and Yamamoto are cited herein again as detailed above.

None of these references teaches the claimed source-mask distance.

Both Noguchi and Martin teach that the source-mask distance is a result-effective variable effecting various properties of the deposited film.

Consequently, it would have been obvious to one of ordinary skill in the art, absent evidence of criticality, to optimize this distance by routine experimentation. See MPEP 2144.05.

(10) Response to Argument

Appellant's arguments, set forth in the Brief, have been fully considered, but they are not persuasive.

Appellant's characterization of the invention as a process that minimizes leakage and thereby facilitates higher definition is noted (Brief, pages 26-27). Appellant argues that, since this advantage is not recognized by the prior art, there is no motivation to combine the references cited by the Examiner. The Examiner disagrees. None of the features/advantages referred to by Appellant are actually claimed. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Further, as long as some motivation or suggestion to combine the references is provided by the prior art taken as a whole, the law does not require that the references be combined for the reasons contemplated by the inventor. See *In re Beattie*, 974 F.2d at 1312. In other words, the fact that Appellant has recognized another advantage which

would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Finally, there is no evidence of record that the combination references, which otherwise teach all of Appellant's claimed process steps, does not result in a product possessing these features/advantages.

Appellant further argues: (i) a further lack of motivation to combine; (ii) the non-analogous nature of the cited references; (iii) improper hindsight reconstruction; and (iv) additional evidence of non-obviousness. The Examiner disagrees.

With respect to (i), it is well-settled that the lack of an anticipatory reference does not support patentability where the claimed invention would have otherwise been obvious to one of ordinary skill in the art. 35 USC 103 authorizes a rejection where, to meet the claim, it is necessary to modify a single reference or to combine it with one or more other references. See MPEP 706.02(j). That a primary reference in an obviousness rejection fails to teach certain features of the claimed invention is to be expected and is the reason why the Examiner has rejected the claimed under 35 USC 103 instead of 35 USC 102. In the grounds of rejection above, the Examiner has discharged the duty of setting forth a *prima facie* case of obviousness by clearly providing motivation for each and every combination of references. It is notable that Appellant's traversal does not directly address any particular motivational statement of record. Rather, Appellant alleges that the Examiner has provided no such motivational statement ("The Examiner does not include an explanation for why it would be obvious to one skilled in the art to modify Arai in such a manner with all three modifications to

arrive at the claimed invention.") and argues the non-analogous nature of the cited references and alleges improper hindsight reasoning.

With respect to (ii), it has been held that a prior art reference must either be in the field of appellant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the appellant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, all of the references not drawn to the manufacture of electroluminescent display devices are related to vapor deposition of a coating film on a substrate, which is the precise mechanism of deposition both claimed by Appellant and disclosed by the primary reference, Arai. It is the Examiner's position that the teachings of all of the cited references are thus within the broader field of Appellant's endeavor and particularly pertinent to the problem with which Appellant was concerned, vapor deposition of a material on a substrate. Appellant is further reminded that a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art and that disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments. See MPEP 2123. Consequently, the fact that Grothe, for example, is not drawn to the manufacture of an EL device, does not detract from its broader teaching regarding vapor deposition, the means of depositing in Arai. One skilled in the art would have readily appreciated the applicability of this teaching to all vapor deposition processes, including that of Arai. Further, contrary to Appellant's assertion, Grothe is not limited only to wide, running webs or ribbons. Rather, as quoted

by Appellant, Grothe teaches "coating of wide surfaces, *such as* wide, running webs, ribbons and the like by vapor deposition" (emphasis added). Clearly the broader teaching concerns wide surfaces (i.e., surfaces having at least one long dimension; such as those of Arai and those claimed by Appellant). Again, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments.

With respect to (iii), In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). As noted above, all of the motivational statements provided by the Examiner are based on the teachings of the references and/or knowledge available to one skilled in the art. None of these motivational statements have been directly addressed by Appellant in traversing the rejections of record.

Finally, with respect to (iv), Appellant argues: "The nonobviousness of the claimed invention is evidenced by the fact that others did not begin to use ideas similar to the present invention until <u>after</u> Applicants' invention. For example, the Examiner has not found a single prior reference showing the claimed invention or anything remotely similar to it." The Examiner disagrees. As noted above, 35 USC 103 authorizes a

rejection where, to meet the claim, it is necessary to modify a single reference or to combine it with one or more other references. See MPEP 706.02(j). Consequently, the fact that the Examiner has not found the invention disclosed in a single reference does not support patentability and mere attorney argument is insufficient to establish that an invention satisfies a long-felt need in the art. See MPEP 710.06 (c)(II).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/William Phillip Fletcher III/

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/Timothy H Meeks/

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